GUM CREEK WATERSHED DEMONSTRATION PROJECT

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REFERENCE: Proceedings of the 1991 Georgia Water Resources Conference, held March 19 and 20, 1991, at The University of Georgia, Kathryn J. Hatcher, Editor, Institute of Natural Resources, The University of Georgia, Athens, Georgia.

INTRODUCTION

The Gum Creek watershed, located in Crisp and Dooly County, consists of 48,000 acres in the heart of Georgia's "farm belt". The watershed was designated as having a high priority for potential nonpoint source pollution by the state Environmental Protection Division in its non-point source (NPS) management plan. Portions of Gum Creek have been found to be eutrophic. The watershed supports intensive agricultural production systems of crops such as peanuts, cotton, orchards, small grains and soybeans. It is located in an area defined as a most significant groundwater recharge area.

The overall purpose of the Gum Creek project is to increase voluntary adoption by farmers of innovative Best Management Practices (BMPs) that will protect and improve ground and surface water quality while maintaining productivity and profitability. Special emphasis will be devoted to installing cost effective BMPs that can reduce the loadings from nutrients and pesticides.

The Gum Creek Water Quality Improvement Project will demonstrate an interagency approach to addressing agricultural water quality concerns. At least seven federal agencies, six state agencies, two Soil and Water Conservation Districts, two county governments, and many private citizens are cooperating to implement Georgia's first state-administrated agricultural cost-share program. The project will aid in development of the framework for a state-funded cost-share program to install BMPs on private land to improve water quality.

It is anticipated that the project, over a five-year period, will significantly improve or protect water quality in Gum Creek and reduce nutrient loading in Lake Blackshear. Over 130 farmers in the watershed will receive direct benefits from the project; however, over 500 farmers in the adjacent area will benefit from seeing how water quality improvement projects can be established on farms. Ultimately, all farmers throughout the state will benefit because Gum Creek will serve as a model project for future development of water quality demonstrations. Total cost of the 1990-95 project is $973,000 from USDA funds and $200,000 from the US EPA.

DESCRIPTION OF WATER QUALITY IMPAIRMENTS

Gum Creek is identified in Georgia's NPS Assessment Report and the NPS Management Plan as an agricultural stream likely to be threatened by agricultural nonpoint sources of pollution. A study sponsored by Buckeye Cellulose in 1984 (Acad. of Nat. Sci. of Philadelphia, 1984) reports that nutrient loading was sufficient for Gum Creek to be classified as eutrophic. A subsequent study, conducted in 1989 (Cofer, H.E., et.al., 1989) for the Lake Blackshear Watershed Association, concluded that control of agricultural release of phosphorus and nitrogen is important in this watershed. The Gum Creek Watershed is also located in a significant Groundwater Recharge Area. As a result, Gum Creek watershed has been assigned a high priority for developing an agricultural stream demonstration program and cost-share watershed project.

Georgia's NPS program is one element of Georgia's Clean Water Strategy. The Strategy is based on a three-step process: waterbody/resource assessment, targeting or identifying the sequence for protecting water resources, and converting ideas and plans into problem-solving action. The NPS Assessment Report and NPS Management Plan (Ga. NPS Assessment Report & Ga. NPS Management Report, 1989) were approved by EPA on January 4, 1990. The objective of the Management Plan is to abate categories of NPS pollution identified in the Assessment Report.

Those categories of nonpoint sources identified in the Assessment Report include: 1) streams draining watersheds with intensive construction activity; 2) streams in agricultural watersheds; 3) streams affected by commercial forestry activity; 4) the Chattahoochee River; 5) groundwaters; and 6) water supply watersheds.

During the four-year period covered by Georgia's NPS Management Plan, the primary focus in agricultural NPS will be continued support of voluntary adoption of best management practices in priority agricultural areas. The goals are to assess streams affected by agricultural activities and restore or maintain good water quality by maintaining streamside vegetation and voluntarily applying additional NPS reduction

measures.

The state designated use of the water of Gum Creek is fishing. Continued use of Gum Creek for fishing is threatened by pollution from point and nonpoint sources. The Gum Creek embayment of Lake Blackshear is nutrient-enriched. Lake Blackshear, which receives the waters of Gum Creek, is an 8,700-acre water reservoir owned by Crisp County Power Company and providing power for 8,071 residential customers. The lake was classified as eutrophic in a 1974 EPA Eutrophication Survey of Georgia Lakes.

The major land use in the watershed is intensive agriculture, with a wide diversity of crops being produced. Several of the subwatersheds have more than 50% of their surface area commonly planted to crops with high fertilizer requirements. Because of the large acreages and diversity of crops, a wide array of agricultural pesticides is used in the project area.

The proximity to Lake Blackshear, which is already classified as eutrophic, and the location of the groundwater recharge area for the Floridan aquifer have caused concern about potential water quality impacts from all sources, including agriculture, both to surface water and to groundwater.

EPD, by including the Gum Creek in its 319 Assessment Report and Management Plan (Ga. NPS Assessment Report & Ga. NPS Management Report, 1989), set the stage for a cooperative multi-agency project to address agricultural NPS in the watershed. A pilot cost-share project has been funded by EPD through Section 319 Clean Water Act funds, and is being implemented by the State Soil and Water Conservation Commission.

GOALS AND OBJECTIVES

The overall goal of the Gum Creek Watershed Demonstration project is to increase voluntary farmer adoption of innovative best management practices that will protect and improve groundwater and surface water quality while maintaining the productivity and profitability of agriculture. Special emphasis will be devoted to installing cost-effective BMPs that can reduce the loadings from nutrients and pesticides. This proposal is specifically developed to expand water quality activities in the watershed that are partially funded by a NPS grant (Section 319) from the Georgia Environmental Protection Division.

Broad objectives of the project are to:

- Reduce nutrient and pesticide pollution of groundwater and surface water through improved cropland, pasture, and streambank management while maintaining or improving farm profitability.
- Reduce pollution potential from agricultural chemicals, livestock waste, fertilizers and sediment through improved design of farmstead structures and wells and improved management practices.
- Increase landowner knowledge of drinking water quality and how it is affected by farming activities.
- Evaluate economic impacts of adopting agricultural practices that improve water quality.
- Reduce potential for contamination of groundwater by nitrate and pesticide leaching through improved irrigation management.
- Initiate a state-funded cost-share program for the installation of Best Management Practices on agricultural land.

The Gum Creek Demonstration Project will focus on reducing agricultural contamination of surface and groundwater through a fully integrated farm system management approach and will demonstrate that a state-funded cost-share program can be effective in reducing agricultural threats to water quality. This approach will require a joint effort involving the Soil Conservation Service (SCS), Extension Service (ES), Agricultural Stabilization and Conservation Service (ASCS), State Soil and Water Conservation Commission (SSWCC), Environmental Protection Agency (EPA), and Georgia Environmental Protection Division (EPD) (Detailed project workplans are available from authors).

Major components of the project will address: cropland management of nutrients and pesticides, farmstead management of nutrients and pesticides, irrigation practices and farmstead management of structures and materials which may contribute to surface and groundwater contamination. Drinking water education programs will be used to improve understanding of existing drinking water quality and how agricultural practices can affect it. These programs will be based on results of water tests of private wells conducted by CES.

Intensive one-on-one assistance will begin with key leaders, and eventually focus on approximately seventy farmers in the watershed. Group planning and educational programs will be a major mechanism of assisting the remaining farmers. These programs will be enhanced through the use of integrated demonstration farms and numerous other farms that demonstrate specific practices. Monitoring efforts will include: groundwater monitoring, in-stream monitoring, and monitoring pollutant delivery from farm fields.

EVALUATION

Evaluation of the demonstration project will concentrate on determining changes in: (a) pesticide and nutrient management; (b) awareness and understanding of the relationship of agricultural activities to water pollution potential and (c) impacts of practice adoption on farm profitability. Changes in the

use of best management practices (BMPs) and their relationship to profitability will be evaluated using one-on-one interviews, telephone surveys, etc.

Documented changes in management practices around the farmstead will include changes related to: management of pesticide mixing and loading areas; pesticide handling, storage, and disposal practices; proper plugging of abandoned wells; management of existing wells; and management of irrigation systems. This will be accomplished through a detailed pre-implementation and post implementation survey.

The impact of drinking water education programs on changing landowners' understanding of their drinking water quality and basic knowledge of principles that affect the potential for water contamination will be evaluated through pre- and post surveys. The effectiveness of the project in improving landowner recognition of potential sources of contamination on their farm will be evaluated. Changes in management practices resulting from educational and cost-sharing will be documented.

The development of functional administrative relationships to facilitate cooperative implementation of the Gum Creek Watershed Project will be evaluated to determine progress in meeting the objective. This will include completion and implementation of a memorandum of understanding that identifies agency roles in selecting and implementing the watershed project.

The overall emphasis of this project will be to demonstrate the viability of using an integrated system of proven Best Management Practices as an approach to profitable agricultural production yet maintaining surface water quality. The intent is to achieve cost effectiveness while minimizing the pesticide and nutrient inputs and optimizing irrigation water applications.

The project will be comprised of four major components: 1) technical assistance to cooperators in developing and implementing a site-specific BMP program; 2) cost-sharing incentives to cooperators; 3) information and education programs for audiences both within and outside the designated project area; and 4) monitoring and evaluation to document and analyze the effects of BMPs on soil, water, and operational profitability and assess attitudes of cooperators and other target audiences to alternative practices as a means of maintaining water quality.

ACKNOWLEDGMENTS

This project is supported by the U.S.D.A. Extension Service under the provisions of the Water Quality Act of 1987. Additional support is provided by the State Soil and Water Conservation Commission, the U.S.D.A. Soil Conservation Service, the U.S. Environmental Protection Agency, the Georgia Environmental Protection Division, and The University of Georgia Cooperative Extension Service.

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